RESPONSIBLE PURCHASING **GUIDE**

# bottled water

RPN
Responsible Purchasing Network
Center for a New American Dream

## About the Guide

The Responsible Purchasing Guide for Bottled Water is published by the Responsible Purchasing Network in print, as a PDF file, and on the web. Print and PDF copies are available to the public. Visit www.ResponsiblePurchasing.org to access the web-based edition of the Guide.



## About the Responsible Purchasing Network

The Responsible Purchasing Network (RPN) was founded in 2005 as the first national network of procurement-related professionals dedicated to socially and environmentally responsible purchasing.

RPN is a program of the Center for a New American Dream (www.newdream.org) and guided by a volunteer Steering Committee of leading procurement stakeholders from government, industry, educational institutions, standards setting organizations, and non-profit advocacy organizations.

## Acknowledgements

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Running the Numbers: An American Self-Portrait

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# Overview

Welcome to the Responsible Purchasing Guide for Bottled Water. This Guide provides information about the impacts of bottled water and the responsible strategies that institutions have used in their bottled water purchasing decisions.

### Social and Environmental Issues

Americans bought a total of 8.3 billion gallons of bottled water in 2006, sold in a variety of containers from small single-serving bottles to multi-gallon water cooler bottles (BMC, 2007). The increasing popularity of bottled drinking water has significant environmental and social impacts, from the energy used to produce the plastic containers and deliver filled bottles to consumers, to the concentrated water withdrawals near bottling facilities, to the plastic waste from discarded bottles. By choosing tap water over bottled water, institutions can not only save money, but also reduce negative environmental impacts.

### Best Practices

Cities, states, and municipalities have developed an array of strategies to decrease their dependence on bottled water and encourage the use of local tap water supplies. These methods fall into three general categories: legislative policies, voluntary efforts led by the government, and public media campaigns. Strategies include banning bottled water, expanding bottle bills to include plastic water bottles, encouraging the use of reusable water containers, and many others. Since the use of bottled water has only recently come under scrutiny, some of the efforts covered in this Guide are in proposal stage, while others are already underway.

### Cost, Quality and Supply

Bottled water is exponentially more expensive than municipal tap water. But despite this extra cost, consumers are not guaranteed a higher quality product. Almost all Americans already have access to safe, reliable municipal drinking water regularly monitored by the Environmental Protection Agency. However, the standards for bottled water quality, monitoring, and reporting are less effective than those for tap water. As a result, consumers sometimes pay a higher price for a lower-quality, higher risk product.

### Policies

Formal policies, including legislation, can provide an institutional mandate for reducing or eliminating the purchase of unnecessary bottled water. San Francisco passed a robust, three-phase policy banning government purchasers from buying bottled water. In addition, a number of alternative strategies have been proposed by various jurisdictions around the country. Of course, it's possible to change purchasing practices even without a policy, but policy helps ensure timely action and accountability.

### Standards

Tap water is regulated by the Environmental Protection Agency, while bottled water is regulated by the Food and Drug Administration because it is considered a food product. The standards are different and are enforced differently. It is not uncommon for bottled water to be sold without ever having been tested by the FDA, especially if it is sold within the same state where it was produced.

## Social and Environmental Issues

Americans bought a total of 8.3 billion gallons of bottled water in 2006, sold in a variety of containers from small single-serving bottles to multi-gallon water cooler bottles (BMC, 2007). The increasing popularity of bottled drinking water has significant environmental and social impacts, from the energy used to produce the plastic containers and deliver filled bottles to consumers, to the concentrated water withdrawals near bottling facilities, to the plastic waste from discarded bottles. By choosing tap water over bottled water, institutions can significantly reduce negative environmental impacts.

### Energy and Emissions

Pumping, bottling, transporting, and chilling bottled water is energy inefficient compared to using the existing network of reservoirs, storage tanks, and pipes that furnish tap water to most homes and buildings in the U.S. (EPI, 2006).

Bottles themselves are one of the major environmental concerns. Ninety-six percent of the bottled water sold in the U.S. in 2005 was sold in polyethylene terephthalate (PET) containers, the vast majority of which were packaged in single-serve sizes of one liter or less (CRI, 2007). PET is derived from petroleum. In 2006, nearly 900,000 tons of PET was used to make bottles for U.S. consumption. According to one estimate, producing these bottles required the energy use equivalent of more than 17 million barrels of oil, and produced over 2.5 million tons of carbon dioxide (Pacific Institute, n.d.). This is the same amount of carbon dioxide that would be emitted by over 400,000 passenger vehicles in one year (EPA, 2007f).

While PET is considered less toxic than many plastics, manufacturing PET resin does generate toxic emissions in the form of nickel, ethylbenzene, ethylene oxide and benzene (EC, 1996). Furthermore, PET plastic bottles are usually made from virgin materials, thus producing additional greenhouse gases. In 2005, an estimated 800 thousand metric tons of carbon equivalent (MTCE) were released in the process of making approximately 50 billion new PET bottles from virgin rather than recycled materials (CRI, 2007).

### End of Life Management

Most plastic water bottles end up as trash. In 2004, only 14.5 percent of non-carbonated beverage bottles made from PET were recycled (APC, 2005). And even those deposited for recycling are not always processed efficiently. In 2004, almost 40 percent of the PET bottles for recycling in the U.S. were exported—often to China—requiring additional energy in transport (EPI, 2006). There are also concerns about lax environmental and worker safety standards of overseas recyclers—creating more pollution in the process of turning plastic bottles and other waste into new materials (Vidal, 2004).

When bottles end up in the trash and are incinerated in connection with a municipality's waste management procedures, chlorine (and potentially dioxin) can be released into the air and heavy metals may be deposited in the ash (CRI, 2007).

### Water Waste

Large quantities of excess water are used to produce bottled water. Millions of gallons of water are used in the plastic-making process, and for each gallon that goes into the bottles, two gallons of excess water are used in the purification process (UCS, 2007).

**Local Water Rights**
Bottling plants can adversely affect local water supplies. Pumping large quantities of water can deplete underground aquifers that supply water to local communities and aquatic wildlife habitats (EPI, 2006). The appropriation of public water supplies by private entities raises social justice concerns when local users are displaced and public resources are commodified (EPI, 2006). These concerns are heightened in the case of imported water, where less affluent and politically powerless local populations may be deprived of vital water resources in order to provide “convenience” water to consumers elsewhere (IFG, 2001).

**Water Quality Issues**
Bottled water is often marketed to suggest it is purer than other choices. Often, that is not the case. According to government and industry estimates, about one fourth of bottled water is actually bottled tap water (and by some accounts, as much as 40 percent is derived from tap water)—sometimes with additional treatment, sometimes not (NRDC, 1999b).

In the U.S., in fact, tap water is more closely regulated. Under the Safe Drinking Water Act, the Environmental Protection Agency (EPA) is responsible for tap water standards. Bottled water is regulated by the Food and Drug Administration (FDA), which bases its standards on EPA's tap water standards, but requires testing less often and for fewer contaminants. In addition, FDA states that its rules do not apply to water packaged and sold within the same state (NRDC, 1999b).

The National Resources Defense Council (NRDC) completed a four year study in 1999 and found that one-third of 103 brands of bottled water studied contained some levels of contamination, including traces of arsenic and E. coli. The study did not conclude that bottled water quality on the whole was inferior to that of tap water, but cautioned that the regulatory framework for bottled water is inadequate to assure consumers of either purity or safety (NRDC, 1999b).

One additional concern with bottled water involves potential leaching from the plastic bottles. While PET plastic is considered more stable and less prone to leaching than other forms of plastic, one study found elevated levels of antimony, a potentially toxic trace element with chemical properties similar to those of arsenic in water bottled in PET bottles, and traced the source of contamination to the bottles themselves. The concentration levels, however, were well below those currently considered safe for drinking water in the U.S. and Canada (SKC, 2006).

In many cases, simply switching from bottled water to tap water is an easy solution. However, not all tap water is the same. The EPA states that over 90 percent of U.S. public water systems meet its standards for safety (EPA, 2007d). But, a 2003 study by NRDC found that due to a combination of pollution and deteriorating equipment and pipes, the public water supplies in 19 of America’s largest cities delivered drinking water that contained contaminant levels exceeding EPA limits (either legal limits or unenforceable suggested limits) and may pose health risks to some residents (NRDC, 2003).

Therefore, before implementing a new policy or practice concerning bottled water, check the EPA’s online database of the federally mandated reports from local water quality districts: **www.epa.gov/safewater**. If the report you need is not in the database, your water district is required to produce and mail the report to customers and will supply them upon request.

# Best Practices

Cities, states, and municipalities have developed an array of strategies to decrease their dependence on bottled water and encourage the use of safe local tap water supplies. These methods fall into three general categories: legislative policies, voluntary efforts led by the government and public media campaigns. Since the use of bottled water has only recently come under scrutiny, many of these efforts are still in the proposal stage.

**Legislative Policies**

For many cities, the most common legislative action taken against bottled water has been to ban the government's purchase of the product. These policies are usually in the form of Executive Orders that originate from either the Mayor or the City Council. Bottled water bans include several key elements.

- **Provide justification for taking action.** Most bans enumerate the negative aspects of bottled water and highlight the positives of local water supplies. These bans primarily focus on environmental and economic rationales such as the oil and energy used in plastic bottle production and bottled water transport; and the cost and quality of tap water compared to bottled water. For more information on these issues, see the Social and Environmental Issues and Cost, Quality, and Supply sections.

- **Target specific bottled water product(s).** The majority of bottled water bans focus on single-serving bottles of water. However some cities, like San Francisco, have bans that also include the larger, 5-gallon bottles made for office water coolers (SF, 2007).

- **Define which actions are prohibited.** In most bans, the *purchase* of bottled water using city, state, or government funds is prohibited. The bans typically do not forbid employees from bringing in bottled water that they have purchased with their own money. However, some governments have banned the *service* of bottled water (e.g. Ann Arbor; see PI, 2007a) or have proposed bans against the *use*, *distribution*, and *sale* of bottled water (e.g. New York; see NY, 2007).

- **Specify when, where, and to whom the ban will apply.** Bottled water bans apply to a range of employees, locations, and events, including but not limited to city departments; city agencies; city contractors; departments and agencies occupying city or rental properties; city premises and workplaces; vending machines; city funded or sponsored events, functions and activities; and city council and committee meetings. In San Francisco's Executive Directive banning bottled water, exceptions are made only for employee contracts that specify the use of bottled water and for "legitimate engineering, health, or fiscal concerns" (SF, 2007).

Aside from banning the purchase of bottled water, several city and state governments have proposed alternative legislative measures to address the issue. Both New York and Massachusetts have attempted to expand their state bottle bills to include plastic non-carbonated beverage containers. Legislators hope that expanding bottle bills to include plastic water bottles will encourage recycling as well as raise money for their environmental programs. One of New York State's Assembly members has also proposed that the State install more public water fountains and better maintain existing ones to expand the public's access to local tap water outside their homes (NY, 2007). Additionally, Chicago's Mayor has proposed a twenty-five cent tax on each bottle of water in hopes of using the tax money to address funding

deficits for the city's water system (Hartman, 2007). It remains to be seen whether any of these efforts will be signed into law.

For complete listings and more information on cities, states, and municipalities that have enacted or proposed legislative policies regarding bottled water, see the Policies section.

**Voluntary Efforts Led by the Government**
Some cities have chosen to discourage the use of bottled water and encourage the use of tap water in ways that do not require legislative action. In October of 2006, Salt Lake City Mayor Ross Anderson asked city employees to voluntarily stop using single-serving bottled waters at city offices, meetings and events (SLC, 2006). The initiative was so well-received that a year later, the Mayor sent a letter to all Salt Lake City restaurants asking them to voluntarily stop selling and serving bottled water at their establishments (SLC, 2007). To substitute for bottled water, the Mayor asked his departments and the city's restaurants to fill reusable water pitchers, cups, and bottles with local tap water. Other places like Ottawa, Canada; Toronto, Canada; Niagara, Canada; and New York State have also encouraged the use of tap water and reusable containers (see PI, 2007b; Knelman, 2007; Zettel, 2007; and NY, 2007, respectively). Toronto even produced and handed out to residents over 20,000 reusable sports bottles with the slogan "Fill with Toronto's Quality Tap Water" printed on them (Knelman, 2007). For more information on select voluntary efforts, see Related Documents below.

**Public Media Campaigns**
Rather than banning bottled water, a number of cities are emphasizing the benefits of local tap water. Most notably, New York City's Department of Environmental Protection recently instituted their "Celebrate the City's Clean Drinking Water Campaign'' (NYC, 2007). This campaign includes advertisements placed in area newspapers highlighting the city's good water quality and supply. Additionally, several articles on New York City's extensive water system can be found on the city's website (NYC, 2007). In 2003, the Los Angeles Department of Water and Power funded a $1 million advertisement campaign to remind residents of the safety and quality of local tap water (Vega, 2007; LA, 2003). The Mayors of both Salt Lake City, UT and Minneapolis, MN have also publicly praised their municipal water supplies and urged residents to use them (SLC, 2007; Marsh, 2007).

It is likely that even more cities and states will start to consider switching from bottled water to tap water in the near future. Recently, the U.S. Conference of Mayors resolved to conduct a study on "the importance of municipal water and the impact of bottled water on municipal waste'' (USCM, 2007). This study was introduced by San Francisco Mayor Gavin Newsom, Salt Lake City Mayor Ross Anderson, and Minneapolis Mayor R.T. Rybak. Two major areas that will be addressed by the study include cost, quality, and availability comparisons of tap and bottled water, as well as the environmental impacts of bottled water production. For access to the full resolution, see the Related Documents section below.

**Related Documents**
Letter to Salt Lake City Cabinet members from Salt Lake City Mayor Ross C. Anderson, 2006.

Letter to Salt Lake City restaurants from Salt Lake City Mayor Ross C. Anderson, 2007.

U.S. Conference of Mayors Adopted Resolutions, "Importance of Municipal Water", June 2007. Page 160.

## Cost, Quality, and Supply

Bottled water is exponentially more expensive than municipal tap water. But despite this extra cost, consumers are not guaranteed of getting a higher quality product. Almost all Americans already have access to safe, reliable municipal drinking water regularly monitored by the Environmental Protection Agency. However, the standards for bottled water quality, monitoring, and reporting are less effective than those for tap water. As a result, consumers sometimes pay a higher price for a lower-quality, higher risk product.

### Cost

Estimates show that bottled water costs between 240 and 10,000 times more than tap water (NRDC, 1999a). “For example, in California average tap water costs about $1.60 per thousand gallons (about one tenth of a cent per gallon), while it has been reported that average bottled water costs about $0.90 per gallon – a 560-fold difference” (NRDC, 1999b; Allen and Darby, 1994). In San Francisco, the price of a gallon of bottled water is nearly equal to the price of a thousand gallons of local tap water (SF, 2007). Despite this figure, the city of San Francisco spent nearly $500,000 a year on bottled water, paper cups, and dispenser rentals before instituting its ban on the purchase of bottled water (Vega, 2007). Even taking into account the bulk water purchases and water delivery contracts used by many institutions, bottled water is still more expensive than an equivalent amount of gasoline. This cost is attributable in large part to the water’s packaging. Since plastic water bottles are derived from petroleum, they are often more expensive than the water they are filled with (Ferrier, 2001). Additional factors that drive up the cost of bottled water include bottling, shipping, marketing, and retailing.

### Quality

It is estimated that approximately 25 to 40 percent of bottled water is actually bottled tap water (NRDC, 1999b). Sometimes this tap water receives further processing or filtration; other times it is bottled directly from the municipal water supply without any extra treatment.

Under the Safe Drinking Water Act, the U.S. Environmental Protection Agency is given the power to set drinking water quality standards and to supervise the implementation of those standards by states, municipalities, and water suppliers (EPA, 2006d). There are several ways to find out the quality of your local water supplies. The easiest way is usually to visit the EPA’s **Safe Drinking Water Information System**, which can be searched by geographic location or water supplier (EPA, 2006e). This database contains information about local public drinking water systems across the United States, including the violation and enforcement history of each system since 1993. Health-based, reporting, monitoring, and other violations are all included in the database.

Additionally, for customers who receive their water from a community water system, water suppliers are federally mandated to provide an annual Consumer Confidence Report which details the quality of the area’s drinking water (EPA, 2006a). These annual reports are typically sent to customers by July 1st. Many are also available online at **www.epa.gov/safewater**. For a map of water systems that violated contaminant or treatment standards in 2002, see page four of the EPA’s “Water on Tap” report (EPA, 2003). More information can also be found by contacting your local water supplier directly or by calling your state’s drinking water agency. Visit your state’s website or call the Safe Drinking Water Hotline at 1-800-426-4791 for agency and supplier contact information.

The EPA does not regulate private well water supplies (EPA, 2007a). In order to ensure drinking water safety, customers reliant on a private well are encouraged have their water tested annually by a state certified laboratory. See the EPA's website for a list of certified labs as well as a listing of contaminants that should be tested (EPA, 2007c; EPA, 2007b). Basic tests can be conducted relatively cheaply, around ten to twenty dollars, by most labs and some municipalities will even test for free (EPA, 2007b). However, tests for certain contaminants can cost up to several hundred dollars.

According to the EPA's 2003 "Water on Tap" report, "actual events of drinking water contamination are rare, and typically do not occur at levels likely to pose health concerns" (EPA 2003, p4). However, there are several sources of contamination that can threaten drinking water quality. These include, but are not limited to, improperly handled chemicals and wastes; naturally-occurring contaminants; and water that has been improperly treated or disinfected (EPA 2003, p4). In addition, one of the biggest sources of drinking water contamination (especially lead contamination) is poorly maintained water distribution systems. Water must travel through a vast system of pipes before it reaches homes and workplaces around the country. Over the next two decades, it is projected that U.S. water systems will have to invest more than $275 billion to update their infrastructure and continue to provide safe drinking water (EPA, 2005). And while the EPA regularly monitors drinking water for health risks both after treatment and at several points along the supply's distribution path, it is nearly impossible to regulate the water supplies at each and every point of use in the country (EPA 2003, p7). If the pipes and plumbing nearest your area or residence have not been properly maintained, drinking water that may have initially met all of the EPA's quality criteria may still end up contaminated.

Despite the small chance of tap water contamination, it should not be assumed that bottled water is safer than tap. Bottled drinking water is regulated as a packaged food product by the U.S. Food and Drug Administration (FDA) and is subject to the same EPA standards that apply to public drinking water. However, "bottled water does not undergo the same testing and reporting as water from a treatment facility [and] water that is bottled and sold in the same state may not be subject to any federal standards at all" (EPA 2003, p15). To find out if a particular bottled water meets the FDA's standards, visit NSF International's website (NSF, 2004). NSF is a non-profit, non-governmental organization that sets national standards and certifies a wide variety of products, including bottled water. An additional resource is the International Bottled Water Association, which lists bottled water brands that meet standards stricter than those of the FDA (IBWA, 2005). For more details about drinking water regulations, see the Standards section.

**Supply**

In the United States, an estimated 170,000 public and private drinking water systems are regulated by the EPA (EPA, 2006b). These systems served reliable and safe drinking water to approximately 278.2 million people, or about 90 percent of Americans, in the year 2000 (EPA, 2000; EPA, 2006c). But despite the country's water quality and vast infrastructure, bottled water sales have grown faster than any other type of beverage, bringing in over $35 billion annually worldwide according to the Beverage Marketing Corporation (Howard, 2003). The marketing and retail of bottled water today is so ubiquitous that a recent study found that over 50 percent of all Americans drink bottled water and almost a third drink it regularly (Howard, 2003). Since approximately 25 to 40 percent of bottled water comes from municipal water supplies, this rate of consumption can greatly impact local water sources and the residents that depend on them (NRDC, 1999b). For more information on the problems associated with the supply of bottled water, see the Social and Environmental Issues section above.

Convenience and powerful marketing are two reasons behind the explosive growth in bottled water sales. Many consumers use bottled water where there is limited access to tap water, such as public places like city parks (Howard, 2003). However, a New York State Assemblyman recently observed that “as sales and availability of bottled water have grown in recent years, public water fountain placements have seemed to diminish or disappear completely” (NY, 2007). In Boston, for example, there are more than 200 city parks but only 127 public drinking water fountains, some of which are out of order due to “age or vandalism” (BG, 2007; Pollak, 2007). The city’s Commissioner of Parks and Recreation has cited cost concerns and some parks’ lack of access to a public water supply as reasons for the small number of fountains (Pollak, 2007). If the use of bottled water is to be successfully eliminated, city and state governments will have to increase access to safe municipal water in areas outside of homes and workplaces.

# Policies

Formal policies, including legislation, can provide an institutional mandate for reducing or eliminating the purchase of unnecessary bottled water. San Francisco passed a robust, three-phase policy banning government purchasers from buying bottled water. In addition, a number of alternative strategies have been proposed by various jurisdictions around the country. Of course, it's possible to change purchasing practices even without a policy, but policy helps ensure timely action and accountability.

**Cities with Enacted Policies**

Ann Arbor, MI, City Council announcement, June 2007 (see PI, 2007a)
Bans the city government purchase of commercial bottled water for city sponsored events and functions.

Charlottetown, Prince Edward Island, Canada, Executive Order from the Mayor, June 2007 (see Smith, 2007)
Bans the city purchase of bottled water. Also prohibits bottled water on all city premises, workplaces, and meetings.

Los Angeles, CA, Executive Order from the Mayor, 2005 (see Vega, 2007)
Bans the purchase of bottled water by city agencies for employees.

Niagara, Ontario, Canada, City Council announcement (see Zettel, 2007)
Eliminates bottled water from council meetings and city sponsored meetings.

San Francisco City and County, CA, Permanent Phase-Out of Bottled Water Purchases by San Francisco City and County Government, June 2007
Signed by Mayor Gavin Newsom in June of 2007, this Executive Directive sets three distinct deadlines for eliminating the purchase of bottled water by the city and county. First, city departments and agencies must halt the purchase of single-serving bottled water. Three months later, these same agencies are required to study the feasibility of replacing their bottled water coolers with plumbed-in, bottle-less dispensers. The final step, which will take place two months after the audit, mandates that "all city departments and agencies occupying city or rental properties must switch to bottle-less dispensers that connect to main local tap water lines.'' By using this system, San Francisco will address two of the most common types of bottled water, half-liter bottles and larger, multiple-gallon containers.

**Cities with Proposed Policies**

Charlottesville, VA, Verbal proposal by Mayor David Brown during City Council meeting, August 2007
Proposed ban on the city purchase of bottled water for meetings, city events, and vending machines.

Chicago, IL, Proposal from Alderman George Cardenas, 2007 (see Hartman, 2007)
Proposed twenty-five cent tax on each single-serving of bottled water.

Ottawa, Canada, Proposal by Somerset Councillor Diane Holmes, May 2007 (see PI, 2007b)
Proposed ban on bottled water in municipal headquarters and for city meetings. Also suggested is the creation of a campaign to promote municipal water and the use of reusable water pitchers.

Vancouver, Canada (see Smith, 2007)
Proposed ban on the government purchase of bottled water.

**States with Proposed Policies**
Massachusetts, Proposal by State Representatives Douglas Petersen and Alice Wolf, 2007 (BG, 2007)
Proposed expansion of the state's bottle bill to include plastic, non-carbonated beverage bottles.

New York, Letter to Governor Eliot Spitzer from New York State Assembly Environmental Conservation Committee Chair Robert K. Sweeney, August 2007
This letter proposes an expansion of the New York State Returnable Beverage Container Act to include plastic, non-carbonated beverage bottles. The proposed policies would also discontinue "the purchase, use, distribution, or sale of single serving bottled water by the State… at State-run operations, meetings, or events" and increase the number of public water fountains available at State events (NY, 2007).

## Standards

Drinking water quality is federally regulated in the United States. However, tap water and bottled water are regulated by separate standards implemented by different federal agencies. (See the Quality section above for additional background on these standards).

### United States Environmental Protection Agency, Safe Drinking Water Act, 1974 (Amended in 1986 and 1996).

This law gives the EPA power to set monitoring, treatment, and contaminant standards for the nation's drinking water sources and supply. Maximum contaminant levels (MCLs) are set for both naturally-occurring as well as man-made contaminants. The EPA and the States are responsible for enforcing compliance with these standards. Water systems are tested regularly and randomly at various points along the distribution path. Water suppliers are required to make all violations and any remedial actions publicly available.

### United States Food and Drug Administration, Federal Food, Drug, and Cosmetic Act, 1938.

Under the FFDCA, bottled water is regulated as a packaged food product. Standards applicable to bottled water can be found in the Code of Federal Regulations. Title 21 of the CFR defines the various types of bottled water; sets limits for certain contaminants; lists labeling requirements; and establishes processing and bottling regulations under the Current Good Manufacturing Practice (CGMP). The FDA is required to adopt standards for bottled water that are no less stringent than the EPA's standards for tap water. However, it is the responsibility of the bottler to make sure its water can pass FDA tests and inspections. And since "bottled water plants generally are assigned low priority for inspection," inspectors tend to focus primarily on plants that have received several complaints or have a previous history of violations (Posnick and Kim, 2002).

## Handy Facts

- Americans bought 8.3 billion gallons of bottled water in 2006 (BMC, 2007).
- Worldwide bottled water sales total over $35 billion annually and are growing faster than any other type of beverage (Howard, 2003).
- About 25-40% of bottled water is actually bottled tap water – sometimes with additional treatment, sometimes not (NRDC, 1999).
- In a study of 103 brands of bottled water, one third contained some levels of contamination, including traces of arsenic and E. coli (NRDC, 1999).
- More than 50% of Americans drink bottled water; a third drink it regularly (Howard, 2003).
- Bottled water costs between 240 -10,000 times more than tap water (CRI, 2007).
- California tap water costs about $0.001 per gallon; bottled water costs about $0.90 per gallon – a 560-fold difference (NRDC, 1999b; Allen and Darby, 1994).
- San Francisco spent nearly $500,000 a year on bottled water, paper cups, and dispenser rentals prior to banning the purchase of bottled water (Vega, 2007).
- In 2005, 96% of bottled water sold in the U.S. was packaged in PET containers, the majority in single-serving sizes of one liter or less (CRI, 2007).
- Producing PET bottles uses more than 17 million barrels of oil and produces over 2.5 million tons of carbon dioxide each year (PI, n.d.).
- For each gallon of water that goes into a PET bottle, two gallons of water are used to make the plastic bottles and in the purification process (Weaver, 2007; UCS, 2007).
- 462 million gallons of oil are needed each year to transport water bottles from the factory to the point of sale (SLC, 2007).
- Only about 10% of plastic water bottles are recycled (UCS, 2007).
- In 2005, 50 billion new PET bottles were produced from virgin materials (CRI, 2007)
- Over 90% (278.2 million) of Americans had access to reliable, safe drinking water from U.S. tap water systems in the year 2000 (EPA, 2000; EPA, 2006c)
- Boston has more than 200 city parks but only 127 public drinking water fountains, some of which are out of order (BG, 2007; Pollak, 2007)

## Definitions

| | |
|---|---|
| Antimony | A potentially toxic trace element with chemical properties similar to those of arsenic that has been found to leach from bottles made of PET plastic. |
| Arsenic | A highly poisonous metallic element sometimes found in bottled water. |
| Benzene | A toxic substance emitted when PET resin is manufactured into plastic bottles. Benzene can cause drowsiness, dizziness, and unconsciousness. Long-term exposure can cause anemia, leukemia, and bone marrow problems. |
| Bioaccumulate | Process whereby harmful substances accumulate as they move up the food chain. |
| Bottle Bill | A legislative bill that requires the charging of a refundable deposit on certain beverage bottles and cans, to encourage the return of these containers for recycling while at the same time reducing littering. |
| Bottled water | Drinking water that is put into bottles and offered for sale. |
| Bottle-less water dispenser | A dispenser that connects directly to a main municipal water supply line and dispenses tap water as opposed to bottled water (this includes water fountains as well as dispensers with built-in tanks that hold pre-chilled or pre-heated water). |
| Bulk bottle | Bottles that contain multiple gallons of water (the most common is a 5-gallon bottle). |
| Consumer Confidence Report (CCR) | An annual report of an area's drinking water quality that the EPA mandates water suppliers to send to customers. |
| Current Good Manufacturing Practice (CGMP) | Part of the Federal Food, Drug, and Cosmetic Act which establishes processing and bottling regulations for beverages. |
| Chlorine | A toxin emitted when plastic bottles are incinerated that can be highly irritating to the respiratory organs. |
| Community water system | Public water system that has at least 15 service connections or regularly serves at least 25 year-round residents (EPA, 2006a). |
| Dioxins | Chemical compounds classified as persistent, bioaccumulative, and toxic (PBTs) by the EPA. |

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| *E. Coli* | A bacteria sometimes found in bottled water which can be pathogenic and a threat to food safety. |
| End-of-life management | Process by which products are reused, recycled, remanufactured, or disposed of after their term of useful service expires. |
| Environmentally preferable | Products and services that have a lesser or reduced effect on human health and the environment when compared to other products and services that serve the same purpose. |
| Ethylbenzene | A toxic substance emitted when PET resin is manufactured into plastic bottles. Short term exposure can cause drowsiness, fatigue, headache, and mild eye and respiratory irritation. Long term exposure is linked to damage to the liver, kidneys, central nervous system and eyes. |
| Ethylene oxide | A toxic substance emitted when PET resin is manufactured into plastic bottles. Acute exposures may result in respiratory irritation and lung injury, headache, nausea, vomiting, diarrhea, shortness of breath, and cyanosis. Chronic exposure has been associated with the occurrence of cancer, reproductive effects, mutagenic changes, neurotoxicity, and sensitization. |
| Greenhouse gas | Heat-trapping gas in the Earth's atmosphere responsible for global warming; category includes water vapor, carbon dioxide, methane, ozone, CFCs, and nitrogen oxides. |
| Hazardous substance | 1. material posing a threat to human health and/or the environment, that can be toxic, corrosive, ignitable, explosive, or chemically reactive, 2. substance that must be reported to the EPA if released into the environment. |
| Hazardous waste | Hazardous by-products that can pose a hazard to human health or the environment when improperly managed. |
| Heavy metals | Toxic substances deposited into the ash created when plastic bottles are incinerated. |
| Lead | Metal used in older plumbing infrastructure (i.e. pipes) that can contaminate water supplies and cause blood and brain disorders as well as damage to the nervous system. |
| Maximum Contaminant Level (MCL) | The highest level of a naturally-occurring or man-made contaminant the EPA allows in drinking water. |
| Metric Tons of Carbon Equivalent (MTCE) | The international standard for expressing greenhouse gases in carbon dioxide ($CO_2$) equivalents. |

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| Nickel | A toxic substance emitted when PET resin is manufactured into plastic bottles. |
| Plumbed-in water dispenser | A dispenser that connects directly to a main municipal water supply line and dispenses tap water as opposed to bottled water (this includes water fountains as well as dispensers with built-in tanks that hold pre-chilled or pre-heated water). |
| Point-of-use site | The location where tap water directly reaches a consumer, such as a faucet or water fountain. |
| Polyethylene terephthalate (PET or PETE) | Plastic labeled number 1, used in making synthetic fibers, beverage bottles, liquid containers, and carpet. This plastic is a type of polyester. |
| Post-Consumer Recycled Content | Material recovered from a consumer product at the end of its life, diverted from waste destined for disposal. |
| Public water system | A system that has at least 15 service connections or regularly serves at least 25 year-round residents (EPA, 2006a). |
| Safe Drinking Water Act (SDWA) | Regulates the U.S. municipal drinking water supply; enforced by the EPA. |
| Safe Drinking Water Information System (SDWIS) | A database which contains information about public water systems and their violations of EPA's drinking water regulations (EPA, 2006e). |
| Single-serving bottle | Bottles containing a half-liter (16.9 ounces) of water or less. |
| Tap water | Municipal water drawn directly from a tap, faucet, or other direct local water supply line. |
| Toxic substance | A chemical or chemicals that may present an unreasonable risk of injury to health or the environment. |
| Water distribution system (infrastructure) | An underground network of pipes that delivers drinking water to homes and businesses. Small systems may be relatively simple, while large metropolitan systems can be extremely complex, sometimes consisting of thousands of miles of pipes serving millions of people. |

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